

# **Opinion on the Potential Risk to Human Health Arising from the Bulk Transport of Raw Sugar, Semi Processed Syrups and Thick Sugar Juices Intended for the Production of White Sugar, in Non Dedicated Ships' Tanks and Road Tankers**

(expressed on the 19<sup>th</sup> September 1997)

## **Terms of Reference**

The Committee is asked to examine the potential risk to public health associated with a derogation for the transport of raw sugar from the specific requirement of Directive 93/43/EEC on the hygiene of foodstuffs that bulk foodstuffs in liquid, granulate or powdered form be transported in containers reserved for the transport of foodstuffs only. In assessing the risk the Committee is asked to consider:

- the indeterminate nature of the previous cargo
- the likelihood and potential level of contamination in the of raw sugar, semi-processed syrups or thick sugar juices, taking account of cleaning procedures.
- the control procedures employed by industry to ensure effective cleaning prior to shipment of the unrefined products
- the physico-chemical nature of the refinement process and its capacity to eliminate contaminants.
- the control procedures applied to the final product

## **Background**

Currently, some 1.8Mt of raw sugar are imported into the European Union in non-dedicated ships. In addition, a considerable quantity of semi-processed syrups and thick sugar juices are transported between factories in the European Union by non-dedicated road tankers.

Chapter IV of the Annex to the Directive 93/43/EEC on the hygiene of foodstuffs requires however, that bulk foodstuffs in liquid, granulate or powdered form be transported in containers reserved for the transport of foodstuffs only. Article 3 of the directive 93/43/EEC allows the Commission to derogate from the provisions of the Annex subject to the agreement of Member States. The Commission's services have considered the possibility of such a Directive, the objective of which would be to permit the bulk transport of raw sugar, semi-processed syrups and thick sugar juices, in containers which are not dedicated to the transport of foodstuffs. It would, however, still require all other provisions of the Hygiene and Foodstuffs Directive, and in particular, those relating to Hazard Analysis and Critical Control Point (HACCP) principles (Article 3), the cleaning of transport containers and conveyances, and the avoidance of contamination during transport to be applied.

Adoption of the derogating directive is dependent on assurance that the proposed measure would not give rise to risk to human health and therefore the Committee has been asked for its opinion.

## **Evaluation**

The Committee stresses that the present evaluation is restricted to the bulk transport of raw sugars, semi-processed syrups and thick sugar juices which will undergo a full and effective refining process before use as foods or food

ingredients

Industry's request for a derogation would allow continuation of current practice which permits, a wide range of cargoes to be used prior to the transport of raw sugar or semi-processed syrups and thick sugar juices. In view of the indeterminate nature of the contaminants which may result from a previous cargo, the Committee requested information on the effect of the various steps in transport, cleaning and processing on various classes of contaminants.

It is to be noted that since different considerations apply to the bulk transport of raw (solid) sugar and of semi-processed syrups and thick sugar juices, they are treated separately to some extent in the following risk assessment.

## **Nature of previous cargoes**

### **Transport of raw sugar (solid cargoes)**

The Committee is aware that ships used for the transport of raw sugar are also used for the bulk transport of a very wide range of previous solid cargoes such as cereals, grains, ores, coke, coal and general mixed cargoes. The Committee was informed that, in practice, ships used for bulk transport of raw sugar are generally unsuitable for bulk transport of liquids. It did not therefore give consideration to the potential for contamination of raw sugars from the previous transport of liquid cargoes by ship. It was understood by the Committee that cargoes consisting of substances that are classified as noxious, pesticides for example, must be transported in accordance with international rules which should prevent accidental spillage and eliminate potential for contamination of the raw sugar. A relatively small proportion of raw sugar is transported by road in lorries which, the Committee was informed, are also used at peak demand to transport other raw materials such as coal, coke and lime-stone to the sugar refinery.

### **Transport of unrefined liquid sugars (semi-processed syrups and thick sugar juices)**

The Committee was informed that, semi-processed syrups and thick sugar juices are normally transported in non-dedicated road tankers. Refinery operators restrict previous cargoes to liquids, decide on their acceptability and maintain records.

## **Cleaning and inspection procedures**

### **Transport of raw sugars**

The Committee noted that the Hygiene of Foodstuffs Directive 93/43/EEC requires conveyances and or containers used for the transport of foodstuffs to be kept clean and where they are used for anything other than a foodstuff there must be effective cleaning between loads. In addition, the Directive requires through the principles of the Hazard Analysis and Critical Control Point system contained in Article 3 of the Directive, hazards to health to be identified, and control and monitoring measures applied at the most effective 'critical point' in the process (Annex Chapter VI)

Cleaning and inspection procedures for ships are defined by the Sugar Charter-Party (1) (revised in 1977) article 17 of which requires ship's holds to be physically clean and only to be washed with sea water followed by fresh water if the previous cargo may be "injurious to sugar". Cleaning is subject to independent inspection prior to permission to load the following cargo. Records of cleaning and inspection are retained by the ship's master. The Committee is not aware of the existence of a similar charter governing transport of raw sugar by land but was informed that lorries used under peak demand for the transport of coal, coke and lime stone are washed with hot water under pressure and checked for cleanliness prior to the transport of raw sugar.

(1) The conventional agreement between shipowners and charterers

### **Transport of unrefined liquid sugars**

The Committee was informed that non-dedicated road tankers used for the transport of semi-processed syrups and thick sugar juices are subjected between consignments to cleaning with hot water under pressure and to visual inspection and microbiological control. It was also informed that records of cleaning are kept by the refinery operator.

## **Removal of contaminants during refining.**

The sugar refining is a multi-stage and continuous process which is designed to produce a highly refined product (circa 99.95 % purity, the remaining 0.05 % comprising mainly water and minerals). The critical steps are affination, dissolution, carbonation, filtration through ion-exchange resins and active carbon, evaporation, crystallisation and drying.

Each step has the potential to reduce the level of specific contaminants in the final product (white sugar) and is associated with dilution of any contaminant in the total process volume.

The quantitative effect of the critical steps mentioned above on the reduction of certain classes of contaminant was evaluated in a worst case scenario, where, in spite of the cleaning procedures, 1 kg of a potentially toxic chemical found its way into the refinery process. On the basis of the dilution during the process and reasoned factors which took account of the physico-chemical behaviour of the contaminant during each step, it was concluded that it was unlikely that such contamination would lead to residue levels of concern to public health in the refined sugar.

Having regard to the nature of the individual steps in the process, the Committee paid particular attention to contaminants such as heavy metals, arsenic and non-hydrolysable herbicides. The analytical data provided indicated that the levels of such contaminants were low and consistent with the levels to be expected following refining of the original materials. Further, limited analytical data provided by industry for white sugar produced in different parts of the Community over recent years indicate that the levels of these substances are considerably lower than those in foodstuffs in general. Analytical data for molasses were provided which further demonstrated that the refinery process was very effective in the removal of contaminants. The Committee notes that the levels of contaminants reported in the literature and by industry for refined sugar using analytical methods which were considered to be modern and appropriate for the task, are generally below their limits of detection and are consistent with the expected efficiency of the refining process.

## **Conclusions**

The Committee notes that this request for a derogation relates to a well established industrial practice with a long history of safe use. It concludes that, on the basis of the information available to it, it has no reason to believe that the transport of raw sugar or of semi-processed syrups and thick sugar juices in non-dedicated vessels and in accordance with best industrial practices is likely to give rise to risks to public health.

The Committee was informed that, in practice, ships used for bulk transport of raw sugar are generally unsuitable for bulk transport of liquids.

It noted that the cleaning and control procedures applied during transport of raw solid and unrefined liquid sugars are not well defined in all cases. Furthermore, it appeared that judgement of the acceptability of the cargoes carried prior to bulk semi-processed syrups and thick sugar juices is to some extent discretionary.

In view of the above considerations, the Committee recommends that any derogation be subject to the following additional safeguards:

### **Transport of raw sugars**

- effective cleaning procedures should be introduced to ensure that contamination from transport containers or previous cargoes does not result in a risk to health arising from the consumption of refined sugar. This may be achieved by considering cleaning to be a critical control point within the terms of Article 3 of the Hygiene of Foodstuffs Directive which refers to the principles of HACCP systems

- the prohibition of the use of liquid previous cargoes in bulk for the transport of raw sugar.

### **Transport of unrefined liquid sugars (semi-processed syrups and thick sugar juices)**

- effective cleaning procedures should be introduced to ensure that contamination from transport containers or previous cargoes does not result in a risk to health arising from the consumption of refined sugar. This may be achieved by considering cleaning to be a critical control point within the terms of Article 3 of the Hygiene of Foodstuffs Directive which refers to the principles of HACCP systems
- a list of acceptable previous cargoes.

The Committee's conclusions are applicable to the bulk transport of raw sugars and semi-processed syrups and thick sugar juices which will undergo a full and effective refining process before use as food or food ingredients